QUALITY ASSURANCE REPORT/QUALITY CONTROL REPORT

SE/QA/PR/23 /2022-23, DATE: 23/12/2022

Name of Work	:	Construction of Classrooms to Govt PU College and providing grill fencing and Other developmental Works to ISRO layout Park, Vishweshwarayya under Amrutha Nagarothana Grants. Package – 04 (Estimated cost – 950.00 Lakhs)
Job Code	:	002-23-000002
Bill No.	:	**2nd & Part (RA Bill)**
Type of Test Performed	:	Rebound Hammer test as per IS13311-(2)-1992
Materials on which Tests Was Performed	:	1.RCC Column (M25) (RHT)
Officers present during inspection	:	1.Smt.Thanuja.R. AE– Project division Yelahanka zone 2.Sri. Sundresh AEE– Project division Yelahanka zone 3.Sri C.Shridhar. AEE-Quality Assurance
Project Management Consultants	:	**M/s AARTAN ASSOCIATES BANGALORE.**
Observations	:	Rebound hammer test was conducted in presence of AE and AEE (Project division Yelahanka zone) along with Project Management Consultants representative. The Rebound Hammer Test was conducted randomly on column No, F2 and F3. The work was inspected from Quality Assurance Division on 26.09.2022 & 23.10.2022 when Govt PU College building first floor and second floor roof slab work was under progress respectively . Concrete cubes were casted and tests were conducted after 7 days and 28days. Test reports submitted by PMC is here by furnished. The readings of Rebound Hammer Test are tabulated and analysis of test results done by PMC is here by furnished. The location wise test results are reproduced in the tables shown below.
Test Locations	:	1. Location1: Government PU College in Kempegowda Ward 01, Yelahanka. (RCC Column no F2 and F3)

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ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು ಅಧೀಕ್ಷಕ ಅಭಿಯಂತರರು ಮುಖ್ಯ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ಉಪ-ವಿಭಾಗ ಯಲಹಂಕ ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ವಿಭಾಗ, ಯಲಹಂಕ ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ
ವೃಷಭಾವತಿ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ ವೃಷಭಾವತಿ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾ

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Table-01: Rebound Hammer Test Results for Location-1

Sl. No.	Floor level / Structural Member /Identification	Position/Elevation (cm)	Rebound Hammer Number	Average reading	Compressive Strength (N/mm2) for 28 days	Impact Direction
Sample Tested Location at Government PU College in Kempegowda Ward 01, Yelahanka.						
RCC Column (F2)						
1	First Floor	(Column-F2)	32	33.00	28.50	Horizontal
2			34			Horizontal
3			32			Horizontal
4			34			Horizontal
5			34			Horizontal
6			32			Horizontal

Table-02: Rebound Hammer Test Results for Location-1

Sl. No.	Floor level / Structural Member /Identification	Position/Elevation (cm)	Rebound Hammer Number	Average reading	Compressive Strength (N/mm2) for 28 days	Impact Direction
Sample Tested Location at Government PU College in Kempegowda Ward 01, Yelahanka.						
RCC Column (F3)						
1	First Floor	(Column-F3)	32	32.5	28.00	Horizontal
2			34			Horizontal
3			33			Horizontal
4			31			Horizontal
5			32			Horizontal
6			32			Horizontal

Table-03: Rebound Hammer Test Results for Location-1

Sl. No.	Floor level / Structural Member /Identification	Position/Elevation (cm)	Rebound Hammer Number	Average reading	Compressive Strength (N/mm2) for 28 days	Impact Direction
Sample Tested Location at Government PU College in Kempegowda Ward 01, Yelahanka.						
RCC Column (F2)						
1	Second Floor	(Column-F2)	34	32.00	28.00	Horizontal
2			32			Horizontal
3			30			Horizontal
4			32			Horizontal
5			32			Horizontal
6			32			Horizontal

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ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

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Table-04: Rebound Hammer Test Results for Location-1

Sl. No.	Floor level / Structural Member /Identification	Position/Elevation (cm)	Rebound Hammer Number	Average reading	Compressive Strength (N/mm2) for 28 days	Impact Direction
Sample Tested Location at Government PU College in Kempegowda Ward 01, Yelahanka.						
RCC Column (F3)						
1	Second Floor	(Column-F3)	34	33.33	28.00	Horizontal
2			34			Horizontal
3			34			Horizontal
4			32			Horizontal
5			32			Horizontal
6						

Test Report of Cement Concrete Cubes

Location: Government PU College in Kempegowda Ward 01, Yelahanka.
Sample grade/Age: M25 / 7 Days Compressive Strength

Sl No.	Identification Mark	Date of Casting	Date of Testing	Dimension of Specification	Cross sectional area	Maximum Load in	Compressive Strength	Average Compressive Strength
				mm	Sq.mm	KN	N/mm²	N/mm²
1	First floor Roof Slab	26-09-22	03-10-22	150x150x150	22500	495.00	22.00	22.95
2	First floor Roof Slab	26-09-22	03-10-22	150x150x150	22500	601.50	26.73	
3	First floor Roof Slab	26-09022	03-10-22	150x150x150	22500	520.00	23.11	
4	First floor Roof Slab	26-09-22	03-10-22	150x150x150	22500	500.00	22.22	
5	First floor Roof Slab	26-09-22	03-10-22	150x150x150	22500	480.90	21.37	
6	First floor Roof Slab	26-09-22	03-10-22	150x150x150	22500	500.20	22.23	

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ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ಉಪ-ವಿಭಾಗ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

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ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

ಅಧೀಕ್ಷಕ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

ಮುಖ್ಯ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರ
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Location: Government PU College in Kempegowda Ward 01, Yelahanka.
Sample grade/Age: M25 / 28 Days Compressive Strength

Sl No.	Identification Mark	Date of Casting	Date of Testing	Dimension of Specification	Cross sectional area	Maximum Load in	Compressive Strength	Average Compressive Strength
				mm	Sq.mm	KN	N/mm²	N/mm²
1	First floor Roof Slab	26-09-22	23-10-22	150x150x150	22500	567.60	25.23	28.16
2	First floor Roof Slab	26-09-22	23-10-2022	150x150x150	22500	680.50	30.24	
3	First floor Roof Slab	26-09-22	23-10-22	150x150x150	22500	652.40	29.00	

Location: Government PU College in Kempegowda Ward 01, Yelahanka.
Sample grade/Age: M25 / 7 Days Compressive Strength

Sl No.	Identification Mark	Date of Casting	Date of Testing	Dimension of Specification	Cross sectional area	Maximum Load in	Compressive Strength	Average Compressive Strength
				mm	Sq.mm	KN	N/mm²	N/mm²
1	Second floor Roof Slab	23-10-22	29-10-22	150x150x150	22500	490.00	21.78	22.71
2	Second floor Roof Slab	23-10-22	29-10-22	150x150x150	22500	530.20	23.56	
3	Second floor Roof Slab	23-10-22	29-10-22	150x150x150	22500	512.40	22.77	

Location: Government PU College in Kempegowda Ward 01, Yelahanka.
Sample grade/0Age: M25 / 28Days Compressive Strength

Sl No.	Identification Mark	Date of Casting	Date of Testing	Dimension of Specification	Cross sectional area	Maximum Load in	Compressive Strength	Average Compressive Strength
				mm	Sq.mm	KN	N/mm²	N/mm²
1	Second floor Roof Slab	23-10-22	19-11-22	150x150x150	22500	599.80	26.66	26.92
2	Second floor Roof Slab	23-10-22	19-11-22	150x150x150	22500	630.30	28.01	
3	Second floor Roof Slab	23-10-22	19-11-22	150x150x150	22500	587.20	26.10	

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ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ವಿಭಾಗ
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Conclusion:

The file containing 2nd & part bill has been submitted for the above work to QA department on 15-12-2022 requesting for spot inspection. Engineers of QA/QC division have visited the work spot on 20.12.2022.

During the inspection, it was observed that the items found in the bill, have been executed by the contractor. PMC team was instructed to assess the strength of concrete used for First and second Floor RCC Column (M25 grade) by conducting NDT using rebound hammer test method.

From the test results furnished by PMC consultants, it is concluded that the results of the samples collected are in accordance with the standards/ specifications mention in the IRC codes. However, the results submitted by the PMC have been reproduced here with for further needful action. The results checked by QA/QC relates only for item tested in the particular location randomly.

Further, QA/QC directs the PMC and Engineer in-charge of the work that all materials used for the work shall be inspected, tested and accepted as per the relevant specifications before incorporation in the work. The frequencies and methods of sampling and testing materials, including those required for definite purpose and not covered by MORT&H specifications shall be in accordance to the relevant IRC or BIS or AASHTO/ASTM/BS standards in order of priority.

All materials or work not conforming to the requirements of the specifications shall be considered unacceptable and rejected. The unacceptable materials or works that are rejected shall be immediately removed unless the defects are corrected and approved by the engineer in-charge of work.

This work was inspected on 26-09-2022 and 23-10-2022 as per the request of engineer in charge of work when Govt PU College building first floor and second floor roof slab concrete work was under progress respectively. Further work progress / request for inspection was not intimated to QA division apart from the above mentioned dates & now presently the bill submitted for the work. Therefore randomly NDT (Rebound Hammer Tests) were conducted as explained in this report.

Engineer in charge of work shall ensure that Observations raised during inspection from QA division shall be complied (vide PR No QA/QC/108/22-23 dated 29-10-2022 and PR No QA/212/22-23 dated 15-11-2022) certified by competent authority of respective zone and necessary action to be taken accordingly & also to adopt observations/instructions for the work.

The concerned Engineer in charge of the work shall follow the direction issued by Chief Commissioner Letter number dated 01.08.2022 and 14.09.2022 and take necessary action as appropriate in accordance with the law.

Note:-

This report by QA/QC is pertaining to the work carried out in 2nd & part bill only. Therefore, further QA/QC reports shall be obtained for the items of work carried out in future Running Account bill / Final bill.

Safety precautions shall be taken at work spot to prevent any mishap, injuries or loss of life to general public and construction workers according to guidelines laid down in code of practices.

Engineer in charge of work shall obtain requisite approval and Implement traffic management plan prior to commencement of work.

Engineer in charge of work shall display details of work, work code, cost of project, start and completion date, and information of Engineer in charge of work with contact numbers at work spot.

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ಮುಖ್ಯ ಅಭಿಯಂತರರು
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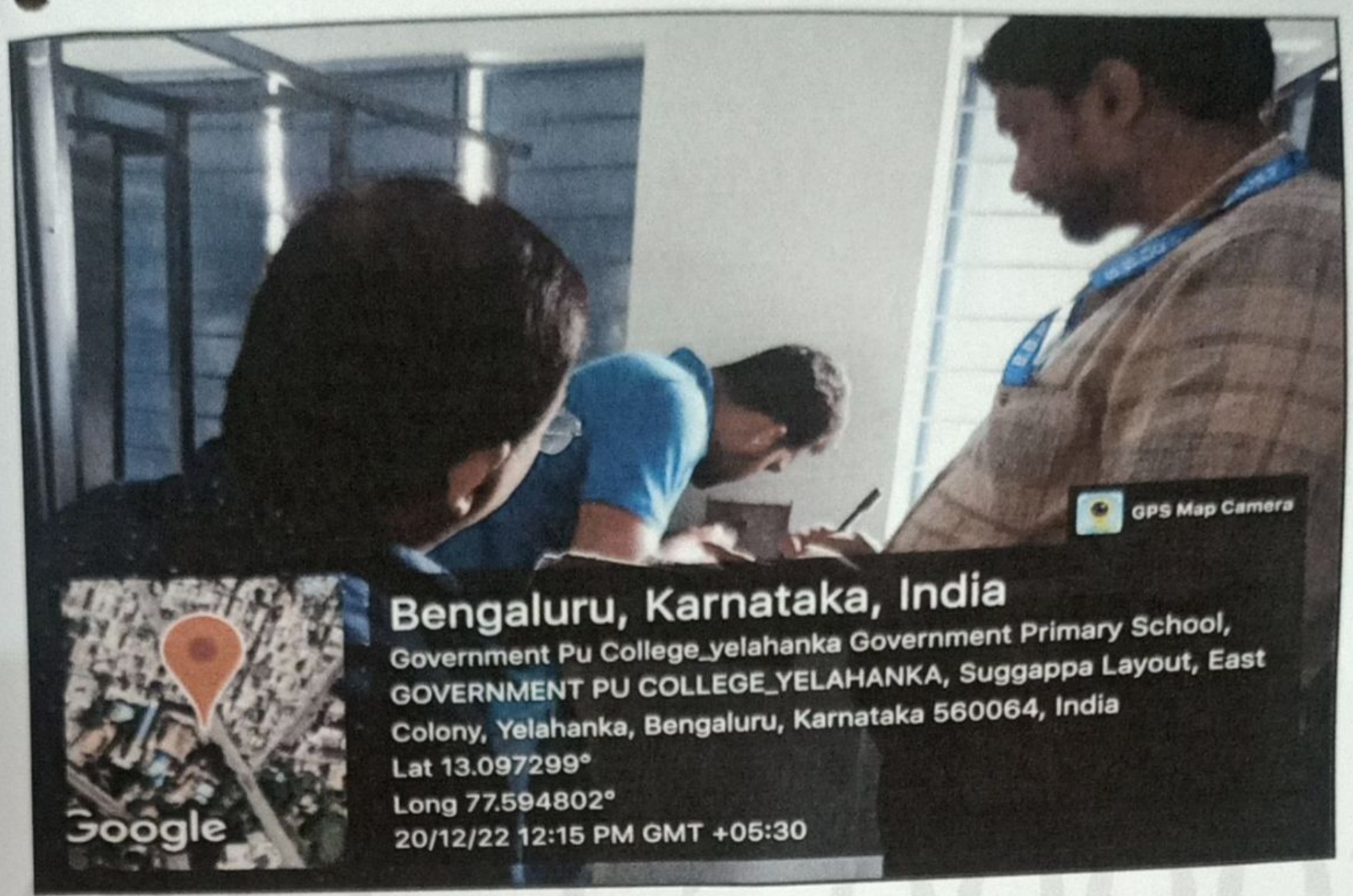
Location 1: Government PU College in Kempegowda Ward 01, Yelahanka. (RCC Column no F2)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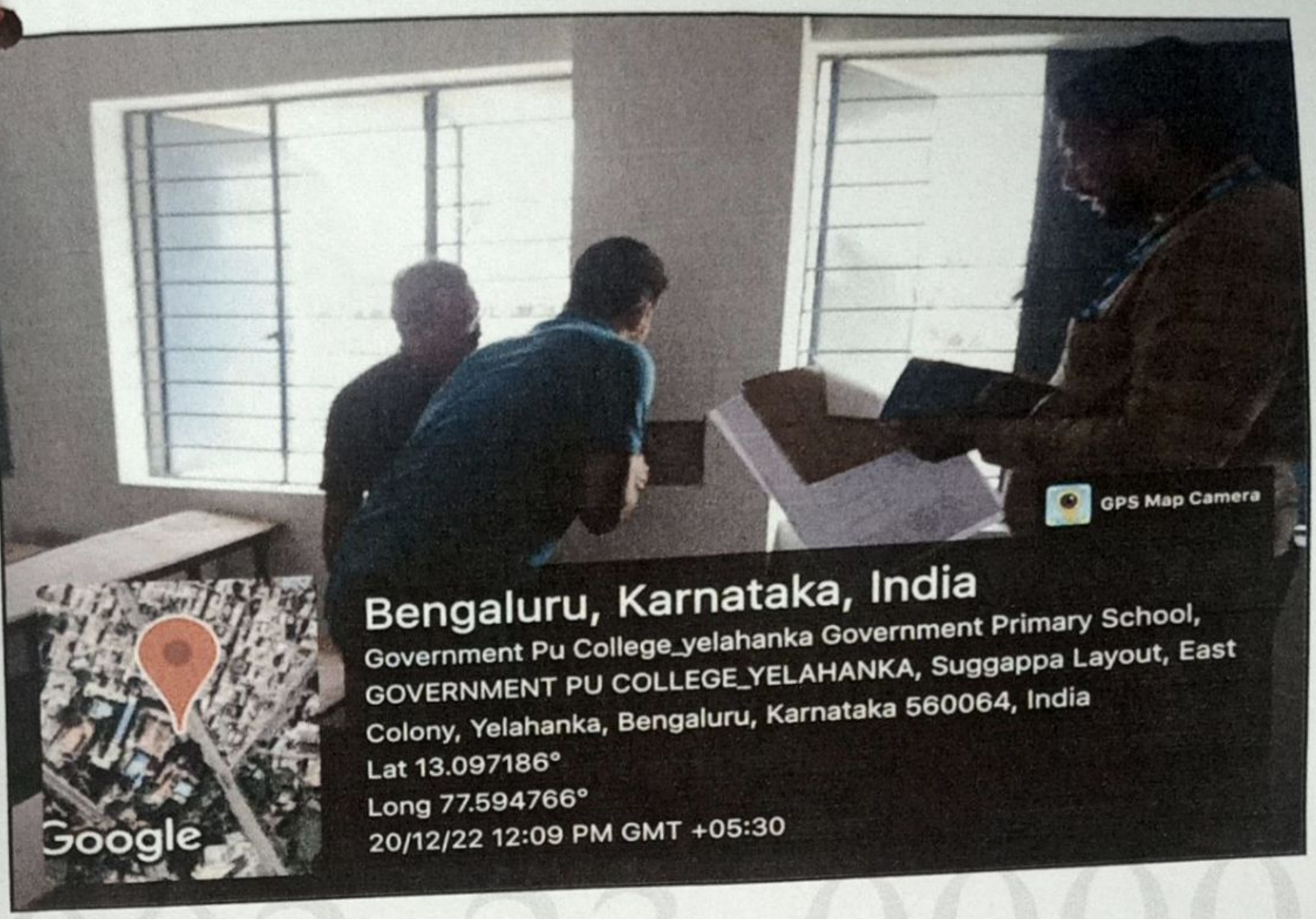
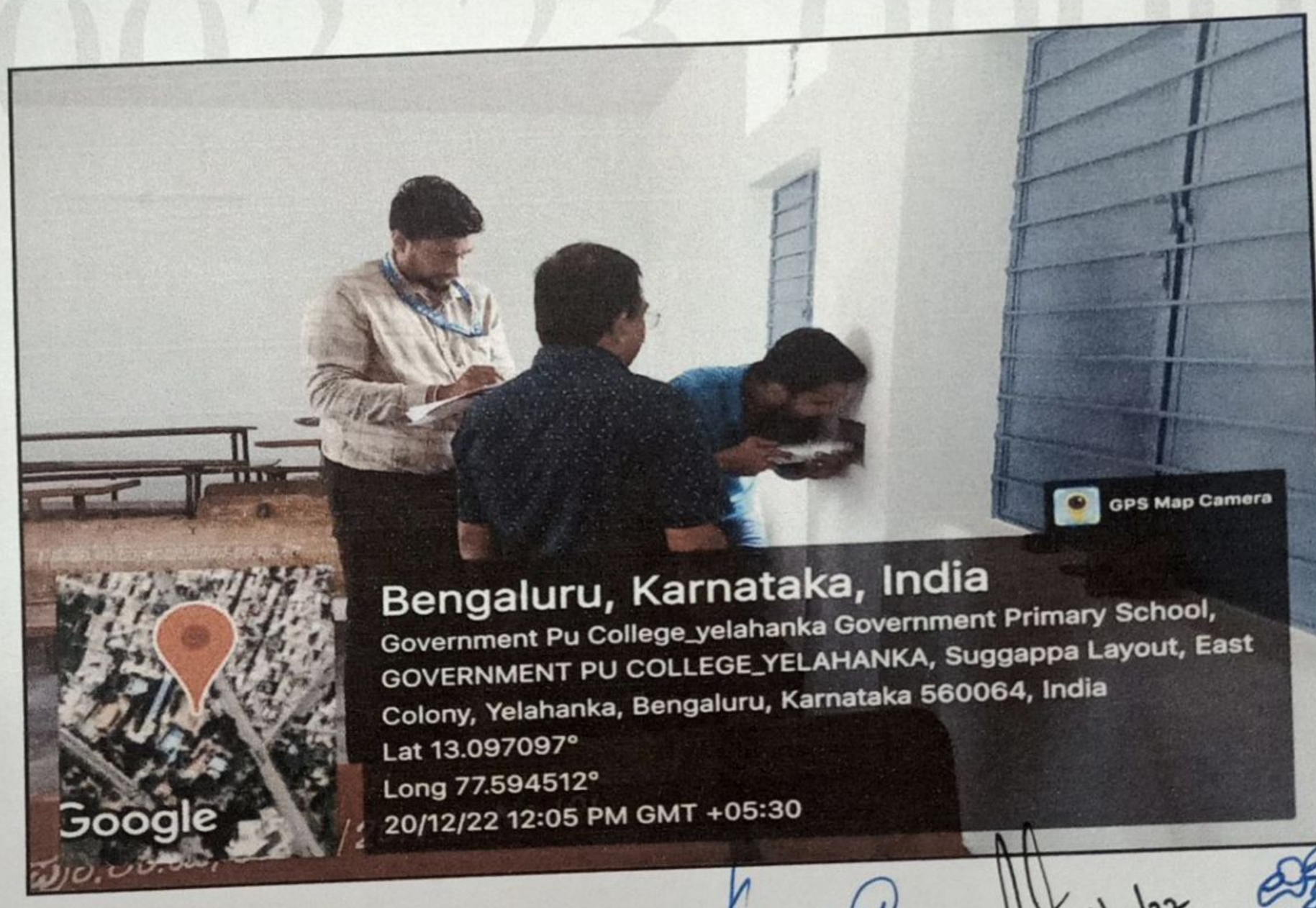
Location 1: Government PU College in Kempegowda Ward 01, Yelahanka. (RCC Column no F3)





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